

Transportation Element

Access to regional transportation is one of the major advantages for the South Lewis County Subarea. Interstate 5 bisects the Subarea, and a number of US and State highways provide excellent local access along with county roads and public and private streets. The Burlington Northern & Santa Fe railroad passes through Vader and Winlock in the western portion of the Subarea. The Toledo-Winlock Ed Carlson Memorial Field Airport is located northeast of Toledo.

A transportation analysis was prepared for Lewis County which included an examination of existing and forecasted transportation conditions and Level of Service standards. This element summarizes the major findings from the analysis, which was prepared by Perteet and Cook Engineering and entitled the South Lewis County Subarea Transportation Plan (SLCSTP). (See Figure 5.1)

Existing Transportation System Conditions

Vehicular

Truck and automobile traffic is important in the South Lewis County Subarea. Interstate 5 is the major transportation corridor along the west coast. As a result, there are large volumes of vehicular traffic through the Subarea, as indicated by the \$26.6 million in gasoline station sales in the Subarea in 2008, which is over twice as much as would be accounted for in sales to the local population. There is a significant amount of truck transportation; in 2002 an estimated 15,000 trucks a day used I-5 in Lewis County.

Interstate 5

I-5 is the major transportation route along the western coast of the United States running from Mexico to Canada. The portion of I-5 in the South County Subarea is approximately halfway between Portland, Oregon and Seattle, Washington. In 2007, I-5 carried an average of 42,000 vehicles per day in the Subarea. In 2009, the volume dropped to 41,000 vehicles per day. I-5 is two lanes in each direction and has five exits in the Subarea: Exit 57 (Jackson Highway), Exit 59 (State Route 506), Exit 60 (State Route 506/Toledo-Vader Road), Exit 63 (State Route 505), and Exit 68 (US Highway 12).

United States Highway 12

US 12 is an east-west highway that runs from Aberdeen, Washington to Detroit, Michigan. US 12 enters the Subarea from the North running concurrently with I-5. At Exit 68, US 12 splits from I-5 and heads east towards Mossyrock. In 2009, US 12 had between 7,100 and 7,900 average vehicles trips per day in the Subarea.

State Route 505

SR 505 is a 20-mile long highway that connects Winlock to State Route 504 near Toutle in Cowlitz County. SR 505 starts in downtown Winlock and heads east across I-5, south to Toledo, and east out of the Subarea. In 2009, SR 505 handled an average of 3,000 to 4,000 vehicles per day in the Subarea.

State Route 506

SR 506 travels between Ryderwood in Cowlitz County to Interstate 5. SR 506 enters the Subarea from the west, through Vader along Seventh Street, and to I-5 at Exit 59. SR 506 then heads north along the west side of I-5 before ending at the Exit 60 interchange with I-5. In the Subarea, SR 506 carried an average of 1,000 to 2,000 vehicles per day in 2009.

County Road Classifications

The Lewis County Comprehensive Plan identifies six rural functional road classifications from interstates to local access roads. Each road classification is designed for a different purpose and serves varying amounts of traffic. The road classifications include interstates, principal arterials, minor arterials, major collectors, minor collectors, and local access roads. The remaining roads in the Subarea not described above are collector and local access roads.

Rail

The Burlington Northern & Santa Fe (BNSF) is the only railroad that passes through the Subarea. The BNSF line runs from Portland, Oregon to Vancouver, British Columbia. There are approximately 13 miles of railroad tracks in the Subarea. This railroad line provides both freight and passenger traffic. In 2006, an average of approximately 50 trains per day utilized this portion of the rail corridor. This corridor has a capacity to accommodate 101 daily trains, but this is limited due to choke points around Centralia that need improvements.

The Amtrak Cascade and Coast Starlight lines travel through the Subarea while providing service between Seattle and Portland with 5 trains per day in each direction. The long-term plan is to increase service between Seattle and Portland to 13 daily roundtrip trains. The Amtrak service stops at Kelso and Centralia, but it does not stop in the Subarea. There are no plans to add a stop in the Subarea, but the Long-Range Plan for Amtrak *Cascade* does identify rail improvement in the Subarea including adding a third main track between Winlock and Chehalis and rail crossovers in Winlock.

Air

There is one airport in the Subarea, the Toledo-Winlock Ed Carlson Memorial Field Airport, located three miles northeast of Toledo. The airport is owned by Lewis County and governed by a five-member Advisory Board. This airport has one runway that is 4,480 feet long and 150 feet wide and is located on a 94-acre site. There are 75 aircraft based at this airport, and the airport had 36,363 annual operations (an operation is a take-off or a landing), most of which are for general aviation with a small amount of military operation. This airport does not serve commercial aviation. Washington DOT estimates that the airport accounts for 76.5 jobs, \$1,358,000 in labor earning, and \$4,967,000 in economic activity. Recent improvements at the airport include runway repaving, new lighting and drainage systems, and new security cameras. Planned projects include installation of instrument approach devices, rehabilitation of the taxiway, and development of aircraft hangars. An Airport Master Plan is currently being prepared.

Transit

A public transportation agency does not serve the South County Subarea. The closest public transit agency to the Subarea is Twin Transit that serves the Cities of Centralia and Chehalis. CAP Rural Transit provides intercity service for Cowlitz County. The Longview to Tumwater route

stops at I-5 interchange with SR 505, Exit 63 (Toledo/Winlock). This service runs twice a day in each direction during the week and once on Saturday. Lewis County Senior Transportation (LCST) provides transportation for the senior citizens in the County.

Non-motorized

Bicycle Facilities

There are few dedicated bicycle transportation facilities in the South County Subarea. Most of the bicycle transportation routes are shared facilities with automobiles. There are two major bicycle races through the Subarea each year: the Lewis County Historical Bicycle Ride in May and the Seattle-to-Portland Classic in July.

Pedestrian Facilities

Pedestrian facilities are provided in Lewis County as sidewalks, walkways, roadway shoulders, and shared facilities. Sidewalks are typically provided in urban areas. Paved shoulders and shared roadways provide pedestrian transport in the rural parts of the County.

Pathways/Trails

There are numerous recreational walking paths and trails in the Subarea. Most of the trails in the Subarea are in two of the parks, Lewis & Clark State Park and the South County Park. More information on trails in the Subarea can be found at the Lewis County Community Trails website www.lewiscountytails.org.

Level of Service Standards

Lewis County has adopted a Level of Service (LOS) standard for the major roads in the county. LOS grades roads based on the Average Daily Traffic (ADT) and the capacity of the roadway: a LOS A means less congestion than a LOS D. LOS standards are chosen as a measure of how much congestion can be tolerated at individual intersections. The Transportation Element of the Lewis County Comprehensive Plan (last updated 2002) provided LOS standards for roads in the Subarea and throughout the County. The standards are based on current (2002) and projected (2007 and 2020) conditions and are included in the Comprehensive Plan. The County is updating the transportation information in a countywide planning process. More recent information is available as provided by Pertee and Cook Engineering for the South Lewis County Subarea Transportation Plan (SLCSTP).

The SLCSTP identifies Level of Service standards at major intersections in South County (see Table 5.1). LOS standards were calculated for both the AM and PM peak hours. The PM peak hour LOS was typically more traffic and lower levels of service, although most AM and PM LOS are similar. LOS is high for the major roads in South Lewis County. All of the intersections have a LOS of C or better and most intersections have an A or B LOS.

Table 5.1: 2008 PM Peak Hour Intersection Level of Service

Intersection	Control	2008 Existing		Worst Approach Queue	
		LOS	Delay	Feet	Direction
SR 505 @ SR 603	3-way stop	C	17.3	41	SB SR 603
SR 505 @ Nevil Road	1-way stop	A	9.4	4	SW Nevil
SR 505 @ Cemetery Road	1-way stop	A	9.5	4	NE Cemetery

Intersection	Control	2008 Existing		Worst Approach Queue	
		LOS	Delay	Feet	Direction
SR 505 @ Kakela Road	1-way stop	A	9.8	1	SB Kakela
SR 505 @ N Military Road	1-way stop	B	11.7	14	SB N Military
SR 505 @ S Military Road	1-way stop	B	11.2	5	NB S Military
SR 505 @ Knowles Road	1-way stop	B	11.0	1	NB Knowles
SR 505 @ I-5 SB Ramps	1-way stop	B	13.0	41	SB I-5
SR 505 @ I-5 NB Ramps	1-way stop	B	13.5	15	NB I-5
SR 505 @ Camus Road	1-way stop	B	10.8	1	NB Camus
SR 505 @ Henriot Road	1-way stop	A	9.5	2	SB Henriot
SR 505 @ Jackson Hwy	2-way stop	C	16.0	26	WB Jackson
SR 505 @ Toledo-Vader Road	2-way stop	C	15.4	13	EB Ash
Avery Road @ SR 603	2-way stop	B	10.8	11	WB Avery
Avery Road @ N Military Road	4-way stop	A	8.9	0	--
US 12 @ I-5 SB Ramps	1-way stop	C	18.4	118	SB I-5
US 12 @ I-5 NB Ramps	1-way stop	B	13.4	16	NB I-5
US 12 @ Jackson Hwy	Signal	B	18.0	190	EB US 12
Jackson Hwy @ Park Road	2-way stop	A	9.4	1	EB Park
Jackson Hwy @ Frost Road	1-way stop	A	9.0	1	EB Frost
Jackson Hwy @ Tucker Road	1-way stop	A	9.6	5	WB Tucker
Jackson Hwy @ Spencer Road	2-way stop	B	10.9	7	WB Spencer
Frost Road @ Henriot Road	1-way stop	A	8.6	2	NB Henriot
SR 603 @ Antrim Road	1-way stop	A	9.6	2	WB Antrim
Nevil Road @ N Military Road	1-way stop	A	9.1	3	EB Nevil
SR 506 @ I-5 SB Ramps	1-way stop	A	9.5	3	SB I-5
SR 506 @ I-5 NB Ramps	1-way stop	A	8.8	5	NB I-5
SR 506 @ Plomondon Road	2-way stop	A	9.9	9	SB Plomondon

Source: South Lewis County Subarea Transportation Plan

The SLCSTP also provides average weekday traffic volumes for some major roadways in the South County Subarea, see Table 5.2. The traffic counts in the Subarea range from less than 300 cars per day on N Military Road to greater than 4,400 cars per day on SR 505 in Toledo.

Table 5.2: 2008 Average Weekday Traffic Volumes

Roadway Segment	2008 Daily Traffic Counts
SR 505 – east of Kakela Road	3,510
SR 505 – west of I-5	4,030
SR 505 – east of I-5	3,690
SR 505 – north of Jackson Highway	3,220
SR 505 – north of SR 506	4,440
SR 505 – south of SR 506	4,090
SR 603 – south of Avery Road W	2,516
SR 603 – north of Nelson Road	1,849
N Military Road – south of Avery Road W	1,948
N Military Road – north of Sargent Road	285

Roadway Segment	2008 Daily Traffic Counts
N Military Road – north of SR 505	1,024
Polmondon Road – south of SR 505	1,032
Jackson Highway – south of Spencer Road	2,668
Jackson Highway – north of Park Road	933
Jackson Highway – south of US 12	1,580
Tucker Road – southwest of Classe Road	831

The SLCSTP focused on the corridor capacity of SR 505 using the volume to capacity ratio (V/C), see Table 5.3. A V/C ratio greater than 0.9 usually leads to congestion. The 2008 PM peak hour segment volume to capacity ratios are shown in the table below. The highest V/C ratio in the Subarea is 0.28; therefore, there are currently no areas of congestion concern along the SR 505 study corridor.

Table 5.3: 2008 PM Peak Hour Link Volumes to Capacity Ratio

SR 505 Segment	Eastbound		Westbound	
	Volume	V/C	Volume	V/C
SR 603 to Nevil Road	159	0.20	210	0.26
Nevil Road to Cemetery Road	133	0.11	173	0.14
Cemetery Road to Kakela Road	152	0.13	200	0.17
Kakela Road to N Military Road	149	0.12	197	0.16
N Military Road to S Military Road	190	0.16	201	0.17
S Military Road to Knowles Road	183	0.15	221	0.18
Knowles Road to I-5 SB Ramps	179	0.15	224	0.19
I-5 SB Ramps to I-5 NB Ramps	257	0.21	127	0.11
I-5 NB Ramps to Camus Road	216	0.18	120	0.10
Camus Road to Henriot Road	204	0.17	115	0.10
Henriot Road to Jackson Highway	194	0.16	107	0.09
Jackson Highway to Ash Road	225	0.28	187	0.23

Future Transportation Conditions

Traffic forecasts in the SLCSTP for the South Lewis County Subarea were based on the County's 2030 and 2035 housing and employment data and the visioning work of the South Lewis County Subarea Steering Committee during 2009 Phase One. It was necessary to evaluate the additional five years (2030-2035) to meet WSDOT interchange evaluation criteria at I-5 Exit 63, however for the purposes of this plan, the two dates are used interchangeably. Land use data was provided by participating jurisdictions. Employment data was developed by Lewis County based on the South Lewis County Regional Market Analysis, prepared by Hovee & Company, 2009. Additional assumptions for 2035 forecast included 75 acres of commercial land (converted to jobs) at Knowles Road for the Winlock UGA and anticipated development east of I-5 north and south of SR 505. For forecasting purposes, it was also assumed that areas around the airport and lands north and west of Toledo would be developed by 2035.

The trip generation forecast for the Subarea assumes that 8,200 new housing units and 7,540 new jobs will be added by the year 2035. In 2008, the Subarea had about 4,200 housing units and 2,250 commercial and industrial jobs.

The SLCSTP made the following network assumptions in its analysis:

- Widening of I-5 to 6 lanes in the South Lewis County by 2035;
- Mickelson Parkway extension;
- Nevil connection to Mickelson Parkway;
- SR 505 – westbound (from I-5) truck climbing lane;

Future Traffic Conditions without Mitigation

The analysis forecasted that Volume to Capacity (V/C) ratios for SR 505 intersections would range from a high of 0.84 (South Military to Knowles) to a low of 0.36 (Jackson Highway to Ash and from Nevil to Cemetery). Other Subarea roadways' V/C ratios would range from a high of 0.40 (Spencer to SR 505) to a low of 0.09 (US 12 to Jackson Highway). Seven SR 505 intersections would operate at LOS F. One County intersection (Northbound I5 ramps at Avery Road) would operate at LOS F.

Mitigations

According to the SLCSTP, nine intersections (seven SR 505 and two Lewis County arterial intersections) have low levels of service which should be mitigated. Two mitigation alternatives were evaluated for each intersection - intersection signals and roundabouts. Cost estimates were calculated for each alternative.

- **SR 505 at Highway 603** – This four legged intersection is currently controlled by a three way stop with free movement westbound on SR 505. Maintaining free westbound movement in the future will cause excessive delay for the other approaches, particularly the southbound left turn movement. Turning this intersection into an all-way stop would give the other approaches a chance to get through the intersection, thus improving the average delay to acceptable standards. However, because the railroad crosses SR 505 just to the east of this intersection, having the east leg stop-controlled will be unsafe. To safely mitigate this intersection a signal will be required so that vehicles will not stop on the railroad tracks. The mitigated intersection will operate at LOS B.
- **SR 505 at North Military Road** – This intersection is currently a stop-controlled intersection with southbound traffic on North Military Road forced to stop before entering SR 505. SR 505 has no stop control on it. In the future, the southbound traffic will experience excessive delay due to waiting for breaks in the traffic flow on SR 505. To mitigate this intersection, an eastbound left turn pocket should be provided to store vehicles waiting to turn left. In addition, this intersection will require a signal to allow adequate time for eastbound vehicles to turn left on to North Military. The mitigated intersection will operate at LOS B.
- **SR 505 at South Military Road** – This intersection is currently a stop-controlled intersection with northbound traffic on South Military Road forced to stop before entering SR 505. SR 505 has no stop control on it at this intersection. In the future, the

northbound traffic will experience excessive delay in having to wait for breaks in the traffic flow on SR 505. The westbound left pocket that will be phased into this intersection in 2020 will not be sufficient for this intersection to operate at a sufficient level of service. To further mitigate this problem, an additional northbound right turn pocket should be added. The mitigated intersection will operate at LOS B in 2035.

- **SR 505 at Knowles Road** – This intersection is currently a three legged intersection with northbound traffic having to stop before entering SR 505. It is assumed that this intersection will continue to be stop-controlled both northbound and southbound. As part of the truck climbing lane mitigation that is recommended, the westbound approach will have one shared left-through lane and the truck climbing lane will drop at the intersection as a right turn only. With this configuration, both northbound and southbound vehicles will experience excessive delay. To mitigate this problem, a signal should be installed to allow northbound and southbound vehicles adequate time to cross SR 505. This mitigation is proposed to be installed by the year 2020. The mitigated intersection will operate at LOS C.
- **SR 505 at Southbound I-5 Ramps** – Currently, this intersection is stop-controlled for the one-way southbound approach with free movement for vehicles on SR 505. As part of the recommended truck climbing lane mitigation, the southbound approach will have a free right turn into the additional westbound truck climbing lane. Even with this free turn lane in 2035, the southbound approach will experience excessive delay. Mitigation for this intersection includes installing a signal to allow southbound traffic adequate time to turn on to SR 505. The intersection will operate at LOS B.
- **SR 505 at Northbound I-5 Ramps** – This intersection currently allows traffic to travel on SR 505 freely and northbound traffic from I-5 is required to stop. In the future, the northbound approach will experience excessive delay and will require mitigation. A signal will allow northbound traffic adequate time to merge on to SR 505. However, with the addition of a signal, eastbound traffic will experience excessive delay unless a left turn pocket is added to keep vehicles turning left from blocking vehicles that are traveling straight. The mitigated intersection will operate at LOS A.
- **SR 505 at Camus Road** – This intersection currently allows traffic to flow freely on SR 505 and requires northbound traffic to stop when approaching SR 505. In 2035, this intersection will operate at an acceptable level of service, however, there will be enough traffic on SR 505 to cause significant delay to northbound traffic, particularly those wishing to turn left onto SR 505. To alleviate some of the cross traffic a westbound left turn pocket is proposed which will provide a two way left turn lane west of the intersection. The mitigated intersection will operate at LOS A.
- **SR 505 at Jackson Highway** – This intersection currently allows traffic on SR 505 to travel freely and requires traffic on Jackson Highway to stop when approaching SR 505. In 2020 and 2035, both the eastbound and westbound approaches will experience excessive delay and queuing. To mitigate this problem, a traffic signal will be necessary to allow vehicles on Jackson Highway to cross traffic on SR 505. No turn pockets will be necessary to make this intersection operate at an acceptable level. Then, the intersection will operate at LOS B with no further mitigation.

- Avery Road at Southbound I-5 Ramps** – This intersection currently allows traffic to travel on Avery Road freely and southbound traffic is required to stop. In the future, the southbound approach will experience excessive delay and will require mitigation. A signal will allow southbound traffic adequate time to merge on to Avery Road. No turning pockets will be necessary to make this intersection operate at an acceptable level. The mitigated intersection will operate at LOS B.

Proposed Improvements

A phased transportation improvement plan with projects identified for completion in 2014, 2020, and 2035 is included in the SLCSTP (see Table 5.4). The improvements range from a total cost of \$12,761,000 to \$13,512,000. The costs include improvements associated with SR 505 as well as with other county arterials. The two mitigation alternatives are based on the installation of traffic signals or roundabouts.

Table 5.4: Phased Transportation Improvement Plan

OPTION	2014	2020	2030	TOTAL
SR 505				
• Signals		\$2,245,000	\$6,083,000	\$8,328,000
• Roundabouts		\$2,044,000	\$6,204,000	\$8,248,000
Arterials				
• Signals	\$3,445,900	\$232,000	\$755,000	\$4,432,900
• Roundabouts	\$3,445,900	\$232,000	\$1,817,000	\$5,494,900

Based on screening of these two mitigation strategies through traffic forecasting, speed analyses, environmental screening, and the operations/maintenance cost, the transportation plan stakeholders agreed that each strategy has merit though the group did acknowledge a preference to pursue the roundabout alternative. A 25-year comparative analysis suggests that the cost for roundabouts could be significantly reduced by crediting project life cost savings from collision reduction, maintenance savings, and fuel savings (\$7.5 million +/-).

Each strategy requires supporting actions by local jurisdictions. Each strategy ensures operating levels of service D or better at 2035. Currently, the identified funding vehicle for all forecast improvements is via developer mitigation. The range of transportation improvements that are planned by WSDOT and Lewis County will be refined on a project by project basis.

Recommended Long Term Option

Roundabouts are the preferred strategy for mitigating intersections under 2035 traffic conditions. Owing to site topography, current permitted access, and the number of existing legal lots of record; a divided highway segment from MP 2.88 (SB Ramps) to MP 2.22 (North Military Road) may provide minimal benefit. The addition of the truck-climbing lane on the north side of the highway from MP 2.88 to MP 2.52 (Knowles Road / Mickelsen Parkway) is anticipated to minimize access congestion (in-bound) on the hill segment. SR 505 roundabout costs are estimated at approximately \$8.2 million.

Potential Improvements (2014, 2020, 2030)

As growth continues, the following locations will need to be further analyzed. Several of these locations are on WSDOT facilities and therefore WSDOT will need to be included in discussions that determine what improvements are warranted to handle traffic associated with State Routes identified in the Subarea plan. Following are potential improvements in the South County Subarea to mitigate the increase in traffic due to growth:

- Additional capacity to SR 505 between the I-5 southbound off ramp and Cemetery Road.
- Add a fourth lane (truck climbing lane) to SR 505 between the I-5 southbound off ramp and Knowles Road.
- Improve six SR 505 intersections to include intersection improvements at N Military Road, S Military Road, Knowles Road, I-5 SB Ramps, I-5 NB Ramps, and Jackson Highway.
- Intersection improvement at the I-5 SB Ramp and US 12 intersection.

Recommended Implementation Strategies

Currently, Lewis County does not have a systematic funding mechanism for transportation improvement associated with new development. Instead, the County relies on the SEPA process to identify appropriate transportation mitigation measures for new development. This is not a sustainable solution because it will continue to allow development until the roadway capacity is filled, and then the only way to develop will be to construct voluntarily off-site roadway improvement with no cost recovery. In order to implement the recommended improvements, the following funding strategies have been identified.

- **Transportation Benefit Districts (TBDs)** are quasi-municipal corporations with independent taxing authority, including the authority to impose property taxes and impact fees for transportation purposes. TBDs can be funded through ad valorem taxes, bonds, fees, charges, and tolls. TBDs have the flexibility to “sell” capacity to future development.
- **Road Improvement Districts (RIDs)** are similar to Local Improvement Districts where road improvements are paid for by an assessment on parcels that benefit from the improvement. RIDs will likely result in large unit costs to developers.
- **Impact Fees** are fee charged by local governments against new development projects to cover the cost of providing roadway improvements and new roads. For Lewis County, the collected impact fees will provide little benefit given the costs to create, maintain, and implement the program.

In the Transportation Impact Mitigation Strategies in WA, Perteet and Cook Engineering and Development Services identified the follow suggested course of action.

- Comprehensively identify system capacity countywide and at intersections of regional significance.
- Generate transportation system improvement plans that can be relied upon for decision making when large development stresses existing system capacity.
- Plan financial reserves into the County’s TIP allowing fair share contributions to capacity projects of significant economic development interest.

- Expand capacity for seeking grant funding or supplemental funding for capacity project of regional significance.
- Define the extent to which TBDs can be used to generate existing system capacity charges for new development.
- In the absence of being able to use TBDs, begin formulating a proposal for legislative support in the development and use of transportation system access charges for local government.
- Implement transportation system access charges in the next several years while significant system capacity still exists.

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